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Intellectual Property and the Law of Fracking Fluid Disclosures: Tensions and Trends

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INTELLECTUAL PROPERTY AND THE LAW OF FRACKING FLUID DISCLOSURES: TENSIONS AND TRENDS

CODY B. JOHNSON*

Abstract

Hydraulic fracturing is a controversial, yet invaluable, facet of the American energy industry. Among the myriad of environmental issues posed by hydraulic fracturing, the chemically treated fluids used in the fracturing process have engendered significant public concern, resulting in a growing push to mandate the disclosure of fluid formulas. In response, the energy industry has resisted these efforts by treating the formulas as trade secrets. Presently, the fight over fracking fluid disclosures is a stalemate between the public's right to know the chemical contents injected into the earth and the energy industry's right to protect its proprietary trade secrets. Indeed, while a growing number of state regulations require the disclosure of fracking fluid formulas, every one of these regulations includes an exception for trade secrets.

Given the unceasing doctrinal tension and lack of uniform regulation in this area, commentators have proposed that the proper balance between public disclosure and competitive incentives lies in the use of patents to protect fracking fluids. However, this Note argues that patents are

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untenable as a means of protecting fracking fluid formulas for many of the existing operators in the energy industry. Specifically, I contend that patentability issues like novelty and the public use bar, coupled with the practical problems of patent prosecution, eliminate patents as a viable alternative to trade secret protections for most fracking operators.

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I. Introduction

In 1997, a revolution began on the north Texas plains that revitalized the American energy sector and permanently altered the geopolitical landscape. Ultimately, the “revolution” that began in Texas’s Barnett Shale brought hydraulic fracturing (“fracking”) into the energy sector’s mainstream and ushered in a boom in domestic oil and gas production.

However, as fracking spread to shale plays throughout the country, environmental concerns and controversy spread with it. Chief among these concerns are the environmental risks posed by the fluids used to fracture the shale, specifically the risk that chemicals in the fracking fluids may contaminate groundwater sources or spread on the surface in the event of an

accident on a fracking well. In the eyes of the energy sector, the specific compositions of fracking fluids, which often include specially formulated chemical additives, are valuable and confidential information—the kind of intellectual property protected through the law of trade secrets. Conversely, because of the potential environmental harms involved, environmentalists, citizen groups, and government agencies have treated fracking fluid compositions as information the public has a right to know.

These conflicting views are locked in tremendous tension. At its core, this tension involves balancing “the public’s interest in identifying chemicals which may find their way into groundwater, and the industry’s need to protect proprietary information in order to maintain a competitive advantage.”¹ Repeated attempts to strike this balance with mandatory disclosure regulations at the federal level have failed. Thus, fracking fluid regulation has been relegated entirely to the states. While state fracking regulations have shed some light on fluid compositions, every mandatory fluid disclosure regulation implemented to date includes an exception for trade secrets and proprietary information.

This Note will address the inherent tension between fracking disclosure regulations and the fracking operators’ right to protect their intellectual property and will examine the viability of using patents as a meaningful compromise between protection and disclosure. Part I introduces fracking and its vital role in oil and gas production, along with the basic tenets of trade secret law—fracking operators’ preferred means of protecting their fluid compositions. Additionally, Part I will address the environmental concerns surrounding fracking fluids and the push for mandatory disclosure regulations. Part II will provide an overview of the lack of federal fracking fluid regulation and the framework of existing regulatory schemes used by the states. Part III will discuss the tensions between trade secrets and disclosure schemes as illustrated by two highly controversial problem areas: (1) the public’s push for greater transparency and litigation involving records requests for fracking disclosures and (2) the medical community’s calls for greater access to fracking fluid compositions. Part IV will examine the growing trend of “fracking patents”—fracking technology and fluids protected under the patent system rather than trade secret law. Ultimately, this Note will evaluate the relative advantages of “fracking patents,” and conclude that patents are a superior, yet impractical, means of protecting fracking fluid technologies for most operators, and that the patent system is

1. Powder River Basin Res. Council v. Wyo. Oil & Gas Conservation Comm’n, 2014 WY 37, 320 P.3d 222, 225 (Wyo. 2014).

not a long-term solution for the intractable tension between fracking fluids and the public's right to disclosure.

A. Hydraulic Fracturing and the "Shale Revolution"

At its most basic, fracking is "the injection of fluid into shale beds at high pressure in order to free up petroleum resources."² More specifically, hydraulic fracturing is a process by which a well is stimulated with specially blended liquids injected into a high-pressure formation, causing the formation to crack open and allowing oil or gas to flow into the wellbore.³ The most prevalent form of hydraulic fracturing is "slickwater fracking," which involves pumping chemically treated fluid into the well with "proppants" used to keep the fractures open and create a more consistent flow of oil or gas.⁴ These chemically treated "slickwater" fluids are at the core of the controversy over public disclosure and the focus of this Note.

Despite its recent prominence, fracking is not a recent invention. Fracking technology was invented by the Stanolind Oil & Gas Company in 1947.⁵ Over the next four decades, fracking technology proliferated steadily but unremarkably, with its primary use in traditional "vertical" wells.⁶ Although fracking was recognized for its usefulness in low-permeability geological formations,⁷ fracking was not utilized in shales—tightly packed geological formations made up of "finely divided particles of older rocks."⁸

Then, in 1997, the fracking "game" changed when Mitchell Energy utilized slickwater hydraulic fracturing in the Barnett Shale outside of Fort Worth.⁹ Mitchell's unconventional use of fracking in the tight shale formation generated "remarkable" results—after ninety days of operation, Mitchell's S.H. Griffin No. 3 well produced more than one million cubic

2. HOWARD R. WILLIAMS & CHARLES J. MEYERS, *MANUAL OF OIL & GAS TERMS* at "F" (Matthew Bender & Co. Inc., 17th ed. 2018).

3. *Id.*

4. John D. Furlow & John R. Hays Jr., *Disclosure with Protection of Trade Secrets Comes to the Hydraulic Fracturing Revolution*, 7 TEX. J. OIL GAS & ENERGY L. 289, 295 (2011).

5. Kristen van de Biezenbos, *Contracted Fracking*, 92 TUL. L. REV. 587, 597 (2018).

6. See Keith B. Hall, *Hydraulic Fracturing: Trade Secrets and the Mandatory Disclosure of Fracturing Water Composition*, 49 IDAHO L. REV. 399, 403 (2013).

7. See *id.* at 404.

8. *Manual of Oil & Gas Terms*, *supra* note 3, at "S."

9. Furlow & Hays, *supra* note 4, at 297.

feet of natural gas, a record for the formation at the time.¹⁰ By 2001, Mitchell's Barnett wells were producing 365 million cubic feet of natural gas a day, a 250% increase from production just two years prior.¹¹ Despite Mitchell's success in the Barnett, the turning point of the fracking revolution came in 2002 when Devon Energy, an Oklahoma-based hydrocarbon exploration company, acquired Mitchell.¹² Devon combined Mitchell's slickwater fracking techniques with its expertise—the process of horizontal drilling. With horizontal drilling, the wellbore angles horizontally after it reaches a certain depth, penetrating a greater length of the carbon reservoir and offering significant production improvements over traditional vertical drilling.¹³ This combination proved incredibly effective in the tightly packed Barnett Shale, and it represented a “worldwide breakthrough” in fracking as a means of oil and gas production.¹⁴

Thus, the so-called “shale revolution” was born with Devon's combination of slickwater fracking and horizontal drilling.¹⁵ The production boom in the Barnett led to massive growth in natural gas shale development across the country. Throughout the 2000s, the combination of fracking and horizontal drilling was used to develop shale plays like the Haynesville Shale in east Texas and Louisiana, the Fayetteville Shale in Arkansas, and the Marcellus Shale in western Pennsylvania, New York, and West Virginia.¹⁶

During this time, shale gas production in the United States grew exponentially. In 2002, the United States produced 5.2 trillion cubic feet of shale gas.¹⁷ In 2019, it produced 26.2 trillion cubic feet of shale gas.¹⁸

10. Gregory Zuckerman, *Breakthrough: The Accidental Discovery That Revolutionized American Energy*, THE ATLANTIC (Nov. 6, 2013), <https://www.theatlantic.com/business/archive/2013/11/breakthrough-the-accidental-discovery-that-revolutionized-american-energy/281193/>.

11. *Id.*

12. R. Marcus Cady, II, *Drilling into the Issues: A Critical Analysis of Urban Drilling's Legal, Environmental, and Regulatory Implications*, 16 TEX. WESLEYAN L. REV. 127, 133 (2009).

13. Furlow & Hays, *supra* note 4, at 291 n.3.

14. Daniel R. Cahoy et al., *Fracking Patents: The Emergence of Patent as Information-Containment Tools in Shale Drilling*, 19 MICH. TELECOMM. & TECH. L. REV. 279, 286 (2013).

15. THE U.S. SHALE REVOLUTION, <https://www.strausscenter.org/energy-and-security/the-u-s-shale-revolution.html#FN1>, (last visited Mar. 25, 2020).

16. Hall, *supra* note 6, at 404.

17. NATURAL GAS EXPLAINED, U.S. Energy Information Administration, <https://www.eia.gov/energyexplained/natural-gas/where-our-natural-gas-comes-from.php>, (last visited Mar. 25, 2020).

Moreover, the shale revolution caused shale gas to play an outsized role in American natural gas production—it accounted for 27.3% of the natural gas produced in 2002; in 2019, 81% of American natural gas was shale gas.¹⁹

Perhaps more importantly, the shale revolution drastically altered the crude oil industry. While the initial fracking boom focused on natural gas, energy producers were quick to utilize fracking and horizontal drilling in shale formations that produce oil.²⁰ The fracking of this “tight oil” now accounts for 61% of U.S. crude oil production.²¹ Four key shale plays account for 87% of all tight oil production: the Bakken in Montana and North Dakota (32%), the Eagle Ford in Texas (28%), the Permian in Texas and New Mexico (23%), and the Niobrara-Codell in Colorado and Wyoming (4%).²² This newfound boom in tight oil has allowed the United States to equal or surpass Saudi Arabia in crude oil production every year since 2013²³ and has led to a significant decrease in America’s dependence on foreign crude oil.²⁴

In short, fracking is an economic and geopolitical force that has catalyzed significant growth in the United States and added hundreds of thousands of jobs to the energy sector.²⁵

B. Fracking and the Law of Trade Secrets

Every jurisdiction in the United States recognizes protection for trade secrets.²⁶ The vast majority of these jurisdictions have adopted the provisions of the Uniform Trade Secrets Act (“UTSA”).²⁷ According to the UTSA:

18. *Id.*

19. *Id.*

20. Hall, *supra* note 6, at 404–05.

21. HOW MUCH SHALE (TIGHT) OIL IS PRODUCED IN THE UNITED STATES?, U.S. Energy Information Administration, <https://www.eia.gov/tools/faqs/faq.php?id=847&t=6>, (last visited Mar. 25, 2020).

22. *Id.*

23. PETROLEUM AND OTHER LIQUIDS DATA, U.S. Energy Information Administration, <https://www.eia.gov/international/data/world>, (last visited Mar. 25, 2020).

24. THE U.S. SHALE REVOLUTION, *supra* note 15.

25. *Id.*

26. PETER S. MENNEL, MARK A. LEMLEY & ROBERT P. MERGES, INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE: 2019, VOLUME I: PERSPECTIVES, TRADE SECRETS AND PATENTS 47 (Clause 8 Publishing, 2019).

27. *Id.*

(4) “Trade Secret” means information, including a formula, pattern, compilation, program, device, method, technique, or process that:

(i) derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use, and

(ii) is the subject of efforts that are reasonable under the circumstances to maintain its secrecy.²⁸

The UTSA’s definition of a trade secret emphasizes the secret’s economic value to its owner. This economic rationale is ingrained in the requirement that a trade secret holder must make reasonable efforts to protect the secret from disclosure.²⁹ At bottom, a trade secret claim has three essential elements: (1) the subject matter involved must be the type of knowledge or information protected by trade secret law; (2) the knowledge or information must be subject to reasonable precautions to protect its secrecy; and (3) the plaintiff must establish that the defendant misappropriated the trade secret.³⁰

While trade secret law has historically been grounded in doctrines of tort law and property rights, the modern approach has been to view trade secrets as intellectual property rights that incentivize innovation in the marketplace.³¹ In this vein, fracking operators have treated various aspects of their fracking fluids as confidential trade secrets to maintain an advantage over their competitors.³² Specifically, fracking operators use trade secret law to protect the overall composition of their fracking fluids, specific chemical additives, the blending process, and ratios of the fluid.³³ Moreover, courts have generally allowed fracking operators to protect their

28. UNIF. TRADE SECRETS ACT § 1(4) (UNIF. LAW COMM’N 1985).

29. MENNELL, LEMLEY & MERGES, *supra* note 26, at 49.

30. *Id.*

31. *See Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 481–85 (1974) (“Trade secret law will encourage invention in areas where patent law does not reach, and will prompt the independent innovator to proceed with the discovery and exploitation of his invention. Competition is fostered and the public is not deprived of the use of valuable, if not quite patentable, inventions.”).

32. Hall, *supra* note 6, at 406.

33. John D. Furlow & Corinne V. Snow, *In the Wake of the Shale Revolution: A Primer on Hydraulic Fracturing Fluid Chemical Disclosure*, 8 TEX. J. OIL GAS & ENERGY L. 249, 260 (2012).

technology from “competitive injury” through trade secret claims for legal and injunctive relief.³⁴

In addition to protecting fracking operators from “competitive injury” at the hands of competitors and former employees, trade secret protections have served to prevent the disclosure of fluid compositions to regulators and the public.³⁵ Effectively, fracking operators have used their interest in protecting proprietary information to defeat every attempt to mandate the complete disclosure of fluid compositions, as evidenced by the fact that every state fracking fluid disclosure regime includes an exception for trade secrets.³⁶

C. Environmental Concerns and the Push for Mandatory Disclosure

Although fracking fluids are predominantly composed of water and sand (typically around 99% of the fluid), there is significant public concern that the chemical additives of the slickwater fluids contain harmful carcinogens.³⁷ The genesis of this concern is the possibility that chemicals in the fluids will enter ground- and surface-water during the fracking process, creating the potential for human ingestion.³⁸ This concern is bolstered by studies that have identified a link between water contamination and the flow and discharge of slickwater fluid in areas where fracking is common.³⁹ More specifically, researchers have identified unusually high concentrations of chemicals like methane in “active” fracking areas.⁴⁰ Other studies have identified chemical contamination in groundwater sources around active fracking areas in West Virginia and Kentucky.⁴¹

34. See *Core Labs. LP v. Spectrum Tracer Servs., L.L.C.*, 532 F. App'x 904, 909–10 (Fed. Cir. 2013) (applying Texas law).

35. John M. Golden & Hannah J. Wiseman, *The Fracking Revolution: Shale Gas as a Case Study in Innovation Policy*, 64 EMORY L.J. 955, 962 (2015).

36. See *infra* Part II.B.

37. Julie E. Zink, *When Trade Secrecy Goes Too Far: Public Health and Safety Should Trump Corporate Profits*, 20 VAND. J. ENT. & TECH. L. 1135, 1158 (2018).

38. *Id.* at 1159; Elliott Fink, Note, *Dirty Little Secrets: Fracking Fluids, Dubious Trade Secrets, Confidential Contamination, and the Public Health Information Vacuum*, 29 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 971, 983 (2019).

39. Stephen G. Osborn et al., *Methane Contamination of Drinking Water Accompanying Gas-Well Drilling and Hydraulic Fracturing*, 108 PROC. NAT'L ACAD. SCI. 8172, 8172–73 (2011).

40. *Id.* at 8173.

41. U.S. ENVTL. PROTECTION AGENCY, MGMT. OF WASTES FROM THE EXPLORATION, DEV., AND PROD. OF CRUDE OIL, NATURAL GAS, AND GEOTHERMAL ENERGY (1987), <https://archive.epa.gov/epawaste/nonhaz/industrial/special/web/pdf/530sw88003a.pdf>.

Although these studies have not conclusively identified fracking as the cause of the contamination, they have led to increased calls for government regulation of fracking and the mandatory disclosure of fracking fluid compositions.⁴² This pro-regulation movement has been amplified by high-profile fracking incidents, like the 2014 explosion of a fracking well in Monroe County, Ohio that released thousands of gallons of fracking fluids into Opossum Creek, a tributary of the Ohio River.⁴³ The introduction of chemicals from the well site into the Ohio River exacted a significant ecological toll on the area and killed over 70,000 fish.⁴⁴ In the wake of the Monroe County incident, it took Halliburton, the well's operator, five days to disclose the chemical contents of the fracking fluids involved to federal, state, and local authorities.⁴⁵ The fact that the firefighters responding to the Monroe County incident, as well as the EPA and Ohio state authorities, were kept in the dark about the chemicals involved attracted significant media attention and garnered a comment from then-Governor John Kasich, who stated that first responders should always have access to the chemicals at wells sites, "including the ones protected by trade-secret laws."⁴⁶

Due in large part to outrage over incidents like the Monroe County fire, the threat of chemically treated fluids has become "the most contentious issue" in the larger debate surrounding oil and gas production.⁴⁷ This contentiousness is exacerbated by a perceived lack of effective state and federal regulation.⁴⁸ Indeed, a contemporary slate of federal legislation aimed at regulating fracking and mandating the disclosure of fluid compositions died on the congressional floor.⁴⁹ Simultaneous efforts at state-level fracking regulation have met varying degrees of success, but

42. See Abraham Lustgarten, *Scientific Study Links Flammable Drinking Water to Fracking*, PROPUBLICA (May 9, 2011, 2:00 PM), <https://www.propublica.org/article/scientific-study-links-flammable-drinking-water-to-fracking> (citing the Osborn study in note 36).

43. Fink, *supra* note 38, at 973.

44. *Id.*

45. Laura Arenschiold, *Fracking Fire Points out Failings*, THE COLUMBUS DISPATCH (Aug. 31, 2014), <https://www.dispatch.com/article/20140831/NEWS/308319916>.

46. *Id.*; Mariah Blake, *Halliburton Fracking Spill Mystery: What Chemicals Polluted an Ohio Waterway?*, MOTHER JONES (July 24, 2014), <https://www.motherjones.com/politics/2014/07/halliburton-ohio-river-spill-fracking/>.

47. Furlow & Hays, *supra* note 4, at 314.

48. *See id.* at 317.

49. *See* Fracturing Responsibility and Awareness of Chemicals Act of 2011, H.R. 1084, 112th Cong. (2011); FUEL Act, H.R. 2133, 112th Cong. (2011); FRAC Act, S. 587, 112th Cong. (2011).

even the successful disclosure regulations include an exception for trade secrets.⁵⁰

Thus, opponents of secrecy in the fracking process were initially left with voluntary disclosure measures within the oil and gas industry. The progress of these voluntary efforts was slow and incomplete—fracking operators invariably refused to disclose the compounds that were “most critical” to their trade secrets, but “the information disclosed nevertheless was more information than had been publicly disclosed before.”⁵¹ The most substantial voluntary development has been the emergence of FracFocus, a private entity, as a platform for fracking operators to publicly disclose their drilling practices.⁵² As a tool of “private governance,” FracFocus proved to be so effective that it is expressly referenced as an acceptable disclosure platform in several state fracking regulation regimes.⁵³

However, despite the incremental progress of voluntary fracking disclosures, opponents of stringent trade secret protections in fracking maintain that there is an unacceptable gap in the public’s knowledge of fracking fluids.⁵⁴

II. Federal and State Regulation of Fracking Fluids

The push for greater transparency in fracking has culminated in increased government regulation of fracking fluids. That said, federal regulation of the fracking industry is currently nonexistent, and the possibility of any renewed federal efforts is “problematic at best.”⁵⁵ Thus, the most important regulatory efforts in the fracking industry are led by the states.⁵⁶ States vary in the scope and rigidity of their regulations. Consequently, the most pronounced tensions between fracking fluid disclosure efforts and fracking operators’ rights to their intellectual property play out at the state level.

50. *See infra* Part II.B.

51. Hall, *supra* note 6, at 406.

52. *See* Amanda C. Leiter, *Fracking as a Federalism Case Study*, 85 U. COLO. L. REV. 1123, 1127 (2014).

53. *Id.* at 1127–28.

54. Fink, *supra* note 38, at 989–90.

55. Bruce M. Kramer, *Federal Legislative and Administrative Regulation of Hydraulic Fracturing Operations*, 44 TEX. TECH L. REV. 837, 862 (2012).

56. *See, e.g.,* William C. Mumby, *Trust in Local Government: How States’ Legal Obligations to Protect Water Resources Can Support Local Efforts to Restrict Fracking*, 44 ECOLOGY L.Q. 195, 202 (2017).

A. Federal Regulation of Fracking Fluids is Nonexistent

In 2016, Judge Scott Skavdahl of the District of Wyoming unequivocally concluded that “Congress has expressly removed federal agency authority to regulate [hydraulic fracturing].”⁵⁷ Although the district court’s opinion was vacated on appeal because the Bureau of Land Management rescinded the regulation at issue, Judge Skavdahl’s statement of the law on federal fracking regulation is accurate.⁵⁸ Simply put, fracking per se is excluded from every meaningful federal environmental statute.

Transparency and public participation are routinely heralded as hallmarks of American environmental statutes.⁵⁹ Nevertheless, fracking is excluded from each of the relevant statutory candidates to shed light on fracking fluid compositions. For instance, the Clean Water Act expressly carves out “water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil or gas production and disposed of in a well”⁶⁰ Similarly, fracking fluids, like other oil and gas wastes, are exempted from the hazardous waste disposal restrictions of the Resource Conservation and Recovery Act (“RCRA”).⁶¹

Even statutes passed with the clear goal of promoting transparency and safety in industrial settings do not cover fracking fluids. Specifically, the Emergency Planning and Community Right-to-Know Act (“EPCRA”), which was passed in the wake of the Bhopal disaster to protect communities from toxic hazards, does not presently cover oil and gas facilities in its “Standard Industrial Classification.”⁶² Similar regulatory efforts, such as the

57. *State of Wyo. v. U.S. Dep’t of the Interior*, No. 2:15-CV-041-SWS, 2016 WL 3509415, at *11 (D. Wyo. June 21, 2016), *judgment vacated, appeal dismissed sub nom. Wyo. v. Zinke*, 871 F.3d 1133 (10th Cir. 2017).

58. *See Zinke*, 871 F.3d at 1146.

59. *See, e.g.,* Jeffrey G. Miller, *Garrison Summary—A Generational History of Environmental Law and its Grand Themes: A Near Decade of Garrison Lectures*, 19 PACE ENVTL. L. REV. 501, 506–07 (2002).

60. 33 U.S.C. § 1362(6) (2019).

61. *See* 42 U.S.C. § 6291(b)(2)(A) (2006); *see also* Michael Goldman, *Drilling into Hydraulic Fracturing and Shale Gas Development: A Texas and Federal Environmental Perspective*, 19 TEX. WESLEYAN L. REV. 185, 203 (2012) (explaining that the RCRA was amended in 1980 to allow the EPA to determine whether fracking was covered by RCRA, and that, “due to the economic importance of oil and gas development,” the EPA determined federal regulation was unwarranted).

62. *See* 42 U.S.C. § 11023(b)(1)(B) (2019). However, an emergency report would likely be required if a fluid release exceeded certain thresholds set by the EPA. *See* 42 U.S.C. § 11004(a)(2)(B) (2018).

rules promulgated by the Occupational Safety and Health Administration (“OSHA”), do not require fracking operators to disclose specific chemical compositions or their quantities.⁶³

The threat to drinking water is at the heart of the public debate over fracking practices. Accordingly, it is unsurprising that much of the acrimony and litigation about the federal regulation of fracking fluids centers on the Safe Drinking Water Act (“SDWA”).⁶⁴ The SDWA was enacted in 1974 to prevent the degradation of drinking water, with Underground Injection Control (“UIC”) programs serving as the primary enforcement mechanism of the Act.⁶⁵ Through the UIC program, the EPA and state agencies are responsible for permitting and regulating operations involving “underground injections.”⁶⁶ A state must submit a proposed UIC program to the EPA that meets the minimum requirements established by the SDWA.⁶⁷ If the EPA approves the state’s proposed UIC program, the state assumes primary regulatory authority and enforcement responsibility for underground injection activities.⁶⁸

However, from 1974 through 1997, the EPA consistently determined that fracking did not fall within the SDWA’s definition of an “underground injection.”⁶⁹ The EPA did not reevaluate this position until the Eleventh Circuit declared it unreasonable in the so-called *LEAF* litigation.⁷⁰ The *LEAF* cases began when the EPA denied the Legal Environmental Assistance Foundation’s (“LEAF”) petition to withdraw the EPA’s approval of Alabama’s UIC program.⁷¹ Alabama’s UIC program, which the EPA approved in two parts over 1982 and 1983, did not regulate fracking as an underground injection activity.⁷² LEAF contended that the SDWA required fracking regulation.⁷³ In response, the EPA took the position that hydraulic fracturing is not an “underground injection” within the meaning

63. See 29 C.F.R. § 1910.120 (2019) (does not mandate the disclosure of specific chemical components or quantities).

64. Safe Drinking Water Act, 42 U.S.C. §§ 300h–300h-8 (2005).

65. 42 U.S.C. §§ 300h-1–300h-3.

66. *Id.*

67. 42 U.S.C. § 300h-1.

68. *Id.*

69. See Fink, *supra* note 38, at 987; see also Kramer, *supra* note 55, at 848–49.

70. Legal Envtl. Assistance Found., Inc. v. U.S. E.P.A. (LEAF I), 118 F.3d 1467, 1471 (11th Cir. 1997); Legal Envtl. Assistance Found., Inc. v. U.S. E.P.A. (LEAF II), 276 F.3d 1253, 1255 (11th Cir. 2001).

71. *LEAF I*, 118 F.3d at 1469.

72. See *id.* at 1470–71.

73. *Id.* at 1471.

of the SDWA because that term “encompass[es] only those wells whose ‘principal function’ is the underground emplacement of fluids.”⁷⁴

Because the EPA’s order denying LEAF’s initial petition was a final agency action, the Eleventh Circuit took up LEAF’s petition for review.⁷⁵ The court applied the *Chevron* framework and found that the EPA’s interpretation failed at the first step of the analysis—it failed to effectuate Congress’s unambiguously expressed intent.⁷⁶ Because fracking involves “subsurface emplacement,” the court concluded that it “obviously” fell under the ordinary meaning of underground injection.⁷⁷ Thus, the court held that the EPA exceeded its authority and contravened the plain meaning of the SDWA by failing to regulate fracking.⁷⁸ Subsequent disagreements over the specifics of Alabama’s modified UIC program necessitated a petition for a writ of mandamus that brought the parties back before the Eleventh Circuit.⁷⁹ While the *LEAF* litigation did not ultimately lead the EPA to alter or review other states’ UIC programs, it did “lead to a reevaluation of the EPA’s role in regulating hydraulic fracturing.”⁸⁰

Whatever reform that reevaluation brought with it was, however, short-lived. In 2005, Congress enacted the Energy Policy Act, which amended the SDWA’s definitions by specifically excluding “the underground injection of fluids or propping agents (other than diesel fuels) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities.”⁸¹

As a result, there is no current federal legislation regulating hydraulic fracking fluids. Multiple iterations of the Fracturing Responsibility and Awareness of Chemicals Act (“FRAC Act”), which would bring fracking under the SDWA and mandate the disclosure of fluid compositions, have failed in Congress.⁸² Regulatory efforts to fill the legislative void have met the same fate. For instance, the Department of the Interior (“DOI”) promulgated fracking regulations in 2015 that implemented limitations

74. *Id.*

75. *Id.* at 1472.

76. *Id.* at 1477–78 (citing *Chevron, U.S.A., Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837 (1984)).

77. *Id.* at 1474–75.

78. *Id.* at 1477–78.

79. *LEAF II*, 276 F.3d at 1255.

80. Kramer, *supra* note 55, at 853.

81. Energy Policy Act of 2005, Pub. L. No. 109-58, § 322, 119 Stat. 594, 694 (codified as amended at 42 U.S.C. § 300h (2005)).

82. FRAC Act, S. 587, 112th Cong. (2011); S. 1135, 113th Cong. (2013); S. 785, 114th Cong. (2015); S. 865, 115th Cong. (2017).

similar to the SDWA on federal and Native American lands.⁸³ The state of Wyoming challenged DOI's agency action in federal court, and the court enjoined DOI from enforcing the regulations on the ground that DOI did not have congressional authority to regulate fracking.⁸⁴ This decision culminated in the court's emphatic conclusion that Congress had "expressly removed federal agency authority to regulate [fracking]"⁸⁵ President Trump took office during the pendency of DOI's appeal, and the Trump Administration subsequently rescinded the DOI's fracking regulation, rendering the case unripe for decision.⁸⁶

Thus, the federal government has removed itself from the regulatory arena when it comes to fracking, leaving issues like fracking fluid disclosure to the states.

B. State Fracking Fluid Regulations

As of 2019, twenty-eight states have enacted statutes regulating the disclosure of fracking fluid compositions.⁸⁷ At a "general level," these regulations are similar: they all require fracking operators to disclose the composition of fracking fluids, and they all exempt trade secrets from disclosure.⁸⁸ Moreover, most state disclosure regulations require trade secret holders to disclose chemical information to first responders in the wake of spills or medical emergencies.⁸⁹ The distinctions among the various states primarily come in three areas: first, the method and timing of the required disclosure;⁹⁰ second, the depth of detail required in the operator's

83. Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands, 80 Fed. Reg. 16,128 (Mar. 26, 2015) (codified at 43 C.F.R. § 3162.3 (rescinded)).

84. *State of Wyo. v. U.S. Dep't of the Interior*, No. 2:15-CV-041-SWS, 2016 WL 3509415, at *12 (D. Wyo. June 21, 2016), *judgment vacated, appeal dismissed sub nom. Wyo. v. Zinke*, 871 F.3d 1133 (10th Cir. 2017).

85. *State of Wyo.*, 2016 WL 3509415, at *11.

86. *Zinke*, 871 F.3d at 1145.

87. Lara D. Pringle, *A Closer Look at Hydraulic Fracturing: An Examination of How Various States Address Fracturing Fluid Disclosure Requirements and Baseline Testing for Groundwater*, in *THE LAW OF FRACKING: FEDERAL, STATE, AND LOCAL REGULATION OF MODERN OIL & GAS DEVELOPMENT* (Rocky Mtn. Min. L. Inst., 2019).

88. Hall, *supra* note 6, at 409.

89. See Furlow & Snow, *supra* note 33, at 265–66.

90. Compare N.M. CODE R. 19.15.16.19 (2017) (operators must file disclosure on FracFocus within forty-five days of completing the well), with MONT. ADMIN. R. 36.22.608 (2018) (operators must disclose fluids to state oil and gas board forty-eight hours before starting drilling).

disclosure;⁹¹ finally, and most contentiously, the extent to which the operator's claim for trade secret protection is verified and subjected to challenge.⁹²

1. Methods and Timing of Fracking Fluid Disclosure

Most states that regulate fracking fluid disclosures either require or allow operators to file their disclosures on FracFocus rather than with a regulatory body.⁹³ While FracFocus began as a private platform for fracking operators to make voluntary disclosures, states have adopted it as a central database for fracking information.⁹⁴ Due in part to pressure from state regulators, FracFocus was upgraded in 2013 to include more user-friendly features, such as allowing users to search by chemical ingredients in addition to searching by well locations.⁹⁵ That said, regulators have not universally accepted FracFocus, and some maintain independent public disclosure platforms while others only make fracking fluid disclosures available on request.⁹⁶

Just as most states allow operators to post their fluid composition disclosures to FracFocus, most states only require post-fracking disclosures, “typically [within] 30 to 60 days after the fracturing is complete.”⁹⁷ Because the purpose of fracking fluid disclosures is to provide accurate information to the public, the prevailing attitude is that pre-fracking disclosures are unnecessary.⁹⁸ Moreover, fracking operators typically adjust

91. Compare OKLA. ADMIN. CODE § 165:10-3-10 (2019) (operators must disclose base fluid, each ingredient in chemical additives, and the maximum concentration of the chemical additives), with LA. ADMIN. CODE tit. 43, pt. XIX § 118(C)(1)(d) (2015) (operators only required to disclose chemical additives that are subject to federal regulation as hazardous).

92. Compare CODE ARK. R. § 178.00.1-B-19 (2017) (requiring operator to make written claim for trade secret protection to state oil and gas commission), with TEX. ADMIN. CODE § 3.29(c)(2)(C) (2012) (R.R. Comm'n of Tex., Hydraulic Fracturing Chemical Disclosure Requirements) (operators not required to submit verification for trade secret protection).

93. See Pringle, *supra* note 87.

94. Hall, *supra* note 6, at 429.

95. See Pringle, *supra* note 87.

96. See, e.g., ILL. ADMIN. CODE tit. 62, § 245.720 (2020) (Department of Natural Resources responsible for publishing “master lists” of chemical disclosures); IDAHO ADMIN. CODE r. 20.07.02.211 (2019) (requires disclosure of chemical composition but does not provide a platform for public access, records available on request).

97. Pringle, *supra* note 87.

98. Hall, *supra* note 6, at 424 (“[T]here seems to be little point in requiring a pre-fracturing disclosure”); Pringle, *supra* note 87 (“The primary purpose of the disclosure requirements is to make information available to the public, researchers, and regulators, which is accomplished by post fracturing chemical disclosures.”).

their fluid compositions from well to well, so the composition listed in a pre-fracking disclosure is not guaranteed to be the final formula.⁹⁹ As a result, pre-fracking disclosures requirements are uncommon.¹⁰⁰

2. *Scope of Required Disclosures*

The successful push for state-level regulation has increased the amount of publicly available information on fracking fluids. However, the scope of this information varies by state.

Because the public's right to know the chemical composition of fracking fluids is a central tenet of state regulations, it is unsurprising that most states require fracking operators to disclose the chemical make-up and concentrations of their fluids.¹⁰¹ The majority approach is to require fracking operators to disclose all chemical constituents contained in fracking fluids and their quantities, with a general exception for trade secrets.¹⁰² A minority of states only require fracking operators to disclose chemicals that qualify as "hazardous" under federal regulations.¹⁰³

At a policy level, the varied scope of required disclosures is arguably the "most important of the differences among the various states' regulations."¹⁰⁴ Naturally, proponents of fracking fluid regulation have called for the broadest possible disclosure requirements.¹⁰⁵ Moreover, there are practical advantages to broad chemical disclosures.

The first, and most obvious, benefit of a broad disclosure approach is that it provides the public and regulators with more information, which is a significant end to itself, even if the chemicals disclosed are not "hazardous" as defined by federal regulations. Additionally, there is a risk that limiting disclosures to "hazardous" chemicals will be underinclusive because the

99. Hall, *supra* note 6, at 425.

100. *But see* MONT. ADMIN. R. 36.22.608 (2018) (operators must disclose fluids to the state oil and gas board forty-eight hours before starting drilling).

101. *See, e.g.*, Matthew McFeeley, *Falling Through the Cracks: Public Information and the Patchwork of Hydraulic Fracturing Disclosure Laws*, 38 VT. L. REV. 849, 853 (2014).

102. *Id.* at 885–86.

103. LA. ADMIN. CODE tit. 43, pt. XIX § 118(C)(1)(d) (2015) (operators must disclose "a list of chemical ingredients contained in the hydraulic fracturing fluid that are subject to the requirements of 29 CFR Section 1910.1200(g)(2) . . ."); MICH. DEP'T OF ENVTL. QUALITY, SUPERVISOR OF WELLS INSTRUCTION 1-2011 (2011), https://www.michigan.gov/documents/deq/Supervisor_of_Wells_Instruction_1-2011_428260_7.pdf (only requires the disclosure of Material Data Safety Sheets, which record "hazardous chemicals" under 29 C.F.R. § 1910.1200).

104. Hall, *supra* note 6, at 410.

105. *See, e.g.*, McFeeley, *supra* note 101, at 900.

federal regulations only require the inclusion of chemicals that are harmful to humans, not the environment.¹⁰⁶ Finally, broader disclosures ultimately benefit fracking operators, because the public confidence in regulatory efforts that comes with greater transparency prevents more drastic measures like fracking bans, and operators still have the option to protect their trade secrets.¹⁰⁷ Therefore, the predominant trend in state fracking fluid regulations is to require operators to disclose the identity and concentration of each chemical contained in their fluids. However, in any of these regulations, the true scope of the disclosure required is inherently limited by the regulation's trade secret exception and the extent to which state regulators verify trade secret claims.

3. Trade Secret Verification and Challenges

Thus, despite the normative importance of the difference in scope between state fracking fluid regulations, the most varied and contentious difference between state regulatory schemes is the extent to which operators' claims for trade secret protection are verified and the mechanism for challenging those claims (if any). While all states allow fracking operators to claim trade secret protection, they vary markedly on whether those claims must be verified, and whether regulators or private citizens have standing to challenge those claims through litigation or administrative proceedings.¹⁰⁸ These variations are best illustrated through the regulatory schemes of four states, roughly classified on a spectrum from strictest to most lenient: Wyoming, Colorado, Texas, and Louisiana.

As the first state to regulate fracking fluid disclosures,¹⁰⁹ Wyoming requires upfront verification of trade secret claims.¹¹⁰ In Wyoming, a fracking operator must disclose the "stimulation fluid," the "chemical compound name . . . of each additive used," and the "proposed rate of concentration for each additive" to the state Oil and Gas Conservation Commission.¹¹¹ To gain trade secret protection, the operator must "justify[] and document[] the nature and extent of the proprietary information."¹¹² Practically, the Commission requires a two-part verification policy for trade secret claims—one part "providing justification for deeming all or part of

106. Hall, *supra* note 6, at 411.

107. See generally Furlow & Hays, *supra* note 4, at 317–19.

108. See, e.g., Pringle, *supra* note 87.

109. *Id.*

110. 055-3 WYO. CODE R. § 45(d)(i)–(vi) (2016).

111. *Id.*

112. *Id.* at § 45(f).

the formulation of a product to be a trade secret” and the second, “containing the product name, the product type, the CAS number for each chemical component of the product, and the concentration of the chemicals in the product.”¹¹³ If the Commission grants the operator’s trade secret claim, the second part is detached from the disclosure while the non-proprietary information is made publicly available consistent with the Wyoming Public Records Act (“WPRA”).¹¹⁴

Thus, because Wyoming’s existing fracking fluid regulations require written verification of trade secret claims, the WPRA provides a vehicle for plaintiffs to challenge the trade secret determination through public records litigation.¹¹⁵ For example, an environmental coalition concerned that the Commission was acting as a rubber stamp for fracking operators’ trade secret claims used this provision to challenge the Commission’s refusal to turn over fracking disclosures that it deemed trade secrets.¹¹⁶ The litigation reached the Wyoming Supreme Court and culminated in a settlement requiring the Commission to require greater factual support for trade secret claims made by fracking operators.¹¹⁷

Similarly, Colorado requires fracking operators to disclose the identity and concentration of each chemical additive used in fracking fluids.¹¹⁸ Moreover, Colorado requires that operators seeking to protect trade secrets submit a written claim of entitlement, but, importantly, they are not required to disclose the chemical identity or concentration of the claimed trade secret to the Colorado Oil and Gas Conservation Commission.¹¹⁹ Thus, because the operator’s claim for trade secret protection only describes the essential elements of a trade secret¹²⁰ and not the information itself, there is no clear vehicle for plaintiffs to challenge a trade secret claim

113. *Powder River Basin Res. Council v. Wyo. Oil & Gas Conservation Comm’n*, 2014 WY 37, 320 P.3d 222, 225–26 (Wyo. 2014).

114. WYO. CODE R. § 45(f).

115. *See* WYO. STAT. ANN. § 16-4-203(f) (West 2019) (“Any person aggrieved by the failure of a governmental entity to release records” may challenge denial in district court and seek an order mandating disclosure).

116. *Powder River Basin Res. Council*, 320 P.3d at 245; *see* discussion *infra* Part III.

117. Stipulated Settlement Agreement at 3, *Powder River Basin Res. Council v. Wyo. Oil & Gas Conservation Comm’n*, Docket No. 94650-C (7th Judicial District Court, Jan. 14, 2015).

118. *See* 2 COLO. CODE REGS. § 404-1:205A(b)(2)(A)(ix)–(xii) (2015).

119. *Id.* at § 404-1:205A(b)(2)(B).

120. COLO. OIL AND GAS CONSERVATION COMM’N, TRADE SECRET CLAIM OF ENTITLEMENT FORM 41 FILING, https://cogcc.state.co.us/forms/PDF_Forms/Form41_05312012.pdf.

through public records litigation.¹²¹ Further, Colorado's disclosure regulations do not include a means of challenging trade secrets.¹²² That said, Colorado's regulations are unique in that they ultimately require fracking operators to disclose fluid additives "[u]nless the information is entitled to protection as a trade secret."¹²³ Commentators have suggested that the literal interpretation of this provision limits fracking operators to protecting true trade secrets and that plaintiffs could challenge a trade secret claim by claiming it was erroneous based on this interpretation.¹²⁴ However, to date, there has been no litigation on this point.

Unlike Wyoming and Colorado, Texas does not require any written documentation or verification of a fracking operator's claim for trade secret protection.¹²⁵ Under Texas's fracking fluid disclosure regulations, operators must upload their fluid compositions directly to FracFocus.¹²⁶ Fracking operators may protect claimed trade secrets by excluding the information from FracFocus, but they must note the trade secret claim on the registry and provide "the chemical family or other similar description" for the protected formula.¹²⁷ Because Texas, like Colorado, does not require fracking operators to submit the underlying chemical information to state regulators, there is no avenue for plaintiffs to challenge the trade secret claim through public records litigation.¹²⁸

However, Texas's fracking fluid regulations expressly provide a mechanism for challenging trade secret claims.¹²⁹ Specifically, a "landowner on whose property the relevant wellhead is located," a "landowner who owns real property adjacent" to the wellhead, or a "department or agency of this state with jurisdiction over a matter to which the claimed trade secret information is relevant" may challenge the operator's claim for trade secret protection.¹³⁰ The regulation lays out a specific procedure for making a written challenge to the trade secret, which

121. *See* § 404-1:205A(b)(2)(B).

122. *See* § 404-1:205A.

123. § 404-1:205A(b)(2)(D).

124. *See* Hall, *supra* note 6, at 415.

125. 16 TEX. ADMIN. CODE § 3.29(c)(2)(C) (2012) (R.R. Comm'n of Tex., Hydraulic Fracturing Chemical Disclosure Requirements).

126. *See id.* at § 3.29(c)(2)(A).

127. *Id.* at § 3.29(c)(2)(C).

128. *See id.* at § 3.29(c).

129. *Id.* at § 3.29(f).

130. *See id.* at § 3.29(f)(1)(A)–(C).

is initially decided by the Texas Office of the Attorney General and is appealable to a state district court.¹³¹

Although Louisiana has adopted regulations requiring the disclosure of fracking fluid composition, its regulations do not provide for the verification or challenge of fracking operators' trade secret claims.¹³² Louisiana allows fracking operators to disclose their fluid composition through state regulators or FracFocus, but it does not require the disclosure of chemical compositions that operators claim as trade secrets.¹³³ Rather than submitting verification of their trade secret claims, Louisiana requires fracking operators to "disclose the chemical family associated with the ingredient" and include a "statement that a claim of trade secret protection has been made by the entity entitled to make such a claim" and "the contact information of the entity claiming trade secret protection."¹³⁴ Because Louisiana does not require operators to submit the protected information to regulators, there is no avenue for public records litigation.¹³⁵ Moreover, unlike Texas, Louisiana's disclosure regulations do not provide for trade secret challenges.

Ultimately, state fracking fluid regulations are a true patchwork of laws with varying requirements. Each disclosure regulation creates tensions that have only deepened as the "shale revolution" has grown in magnitude and controversy.

III. Key Tensions Between Disclosure Regulations and Trade Secrets

There is an inherent conflict between trade secret protection, which depends on the information in question being "not generally known,"¹³⁶ and the public's right to know about the risks posed by fracking fluid pollution.¹³⁷ This conflict shapes fracking disclosure regulations, and it is markedly visible in two key areas of tension. First, there is a tension between trade secrets and the public's right to transparency that plays out through public records litigation and impacts the way state regulators verify trade secret claims. Second, there is the highly controversial tension

131. *Id.* at § 3.29(f)(2)–(10).

132. *See* LA. ADMIN. CODE, tit. 43, pt. XIX § 118(C)(2) (2015).

133. *Id.*

134. *Id.* at § 118(C)(2)(a)(i)–(iii).

135. *See id.*

136. *See* UNIF. TRADE SECRETS ACT § 1(4) (UNIF. LAW COMM'N 1985).

137. Hannah Wiseman, *Trade Secrets, Disclosure, and Dissent in a Fracturing Energy Revolution*, 111 COLUM. L. REV. SIDEBAR 1, 9 (2011) ("To predict the potential effects of fracing . . . the chemicals within the fluids must be known").

between trade secrets and the medical community's right to access chemical information that may be pertinent in the wake of a spill or explosion.

A. Trade Secrets and the Threat of Public Records Litigation

Under the most stringent disclosure regimes, regulators vet trade secret claims by requiring operators to submit the information they seek to protect. While this approach has the benefit of thoroughly screening trade secret claims and increasing the amount of publicly available information on fracking fluids, it also places the claimed trade secrets under government control. Thus, proprietary information is potentially subject to public records laws, the “quintessential symbols of government transparency” enacted in every state.¹³⁸

While environmental groups champion greater transparency through public records laws, fracking operators resist these regimes out of a fear that public records requests are a means for competitors to gain a competitive advantage through the disclosure of trade secrets.¹³⁹ States have attempted to tackle this problem by exempting trade secrets from their public records statutes.¹⁴⁰ However, when regulators hold the underlying fracking fluid information, there is still a risk of litigation because potential plaintiffs can request the information then challenge the regulator's denial of the request claiming the trade secret determination is improper. It is precisely because of this risk that states like Colorado elect not to review the underlying information in evaluating trade secret claims under their fracking fluid disclosure regulations.¹⁴¹

Indeed, shortly after enacting its fracking disclosure regulation, Wyoming found itself involved in public records litigation.¹⁴² Wyoming's

138. John Delaney, Comment, *Safeguarding Washington's Trade Secrets: Protecting Businesses from Public Records Requests*, 92 WASH. L. REV. 1905, 1909 (2017).

139. See generally Margaret B. Kwoka, *FOIA, Inc.*, 65 DUKE L.J. 1361, 1379 (2016) (discussing the phenomenon of competitor firms using public records requests for commercial advantages).

140. See, e.g., 65 PA. STAT. ANN. § 67.708(b)(11) (West 2009) (“A record that constitutes or reveals a trade secret or confidential proprietary information” is exempt from state public records act).

141. 2 COLO. CODE REGS. § 404-1:205A, App. I (2012) (“[T]he requesting party could sue the [Colorado Oil and Gas Conservation Commission] in district court to challenge the trade secret designation. Although the trade secret claimant would likely intervene in the lawsuit . . . the [Commission] would nonetheless be a party and would have to devote resources to the litigation. Further, the requesting party could be entitled to its attorneys' fees and costs from the [Commission] The Commission wished to avoid these risks.”).

142. See *Powder River Basin Res. Council*, 320 P.3d at 226.

fracking disclosure regulations include a trade secrets carveout, which protects proprietary information subject to the terms of the WPRA, the state's public records law.¹⁴³ In 2011, an environmental coalition submitted a request under the WPRA for unredacted versions of all undisclosed chemical information provided to the Commission by a host of fracking operators including Baker Hughes and Halliburton.¹⁴⁴ The Commission responded with only redacted versions of the operators' correspondence and justified its denial of the coalition's request under the trade secrets exemption of the WPRA.¹⁴⁵ The coalition filed two more requests, challenging the applicability of the trade secrets exemption and urging the commission to reconsider, both of which the Commission denied.¹⁴⁶

Subsequently, the groups filed a petition for review of administrative action under Wyoming's Administrative Procedures Act ("APA") in state district court.¹⁴⁷ Halliburton intervened in the action, and the parties filed cross-motions for summary judgment.¹⁴⁸ In deciding these motions, the district court considered its role to be reviewing "the [Commission's] decision as an administrative decision" under the APA by determining whether the Commission's determination was arbitrary or not in accord with the law.¹⁴⁹ Deciding whether the Commission's decision was in accordance with law required the district court to determine whether the chemical identity of fracking fluids qualified as a trade secret under the WPRA.¹⁵⁰ Because the meaning of trade secret in the context of the WPRA was an open question, the court looked to three definitions of trade secrets—the definitions under the Federal Freedom of Information Act ("FOIA"), the Third Restatement of Unfair Competition, and the Uniform Trade Secrets Act—and concluded that the chemical information qualified under all three.¹⁵¹ Accordingly, the district court found that the Commission acted in accordance with law under the APA and granted summary judgment in favor of Wyoming and the fracking operators.¹⁵²

143. 055-3 WYO. CODE R. § 45(f) (2016).

144. *Powder River Basin Res. Council*, 320 P.3d at 226.

145. *Id.*

146. *Id.* at 227.

147. *Id.*

148. *Id.*

149. *Id.* at 228.

150. *Id.*

151. *Id.*

152. *Id.*

The coalition appealed to the Wyoming Supreme Court. On appeal, the Court focused primarily on whether the district court had applied the correct standard of review in deciding the parties' cross-motions for summary judgment.¹⁵³ Ultimately, the Court concluded that the appropriate procedure for this challenge was under the WPRA, which allows any person denied access to a public record to apply to a district court for an order "directing the custodian of the record to show cause" for why the denial was proper.¹⁵⁴ Thus, the Court found that the trial court erred in applying the administrative standard rather than "engag[ing] in an independent determination of whether the information withheld was entitled to trade secret protection under the WPRA."¹⁵⁵ The proper procedure for making this determination involves examining the disputed information and making a judgment as to whether the trade secret determination was correct through a show cause hearing with "a variety of tools to make evidentiary determinations," including affidavits and in camera review of the contested records.¹⁵⁶ Because of this procedural error, the Court reversed the trial court and remanded the case with instructions to conduct "appropriate proceedings" if the coalition successfully applied for a show cause order.¹⁵⁷

However, the Court was "unwilling to cast the district court adrift without some guidance on the standard to be applied in trade secret cases under the WPRA."¹⁵⁸ The Court highlighted the similarities between the WPRA and FOIA, including their shared premises that disclosure should generally prevail over secrecy and their liberal presumption that a denial of access to public records is contrary to public policy and should only be allowed with sufficient justification.¹⁵⁹ Given these shared philosophies, the Court determined that the appropriate definition of trade secrets under the WPRA is the narrow definition used under FOIA.¹⁶⁰ According to this definition, a trade secret is "a secret, commercially valuable plan, formula, process, or device that is used for the making, preparing, compounding, or processing of trade commodities and that can be said to be the end product of either innovation or substantial effort, with a direct relationship between

153. *Id.*

154. *Id.*

155. *Id.*

156. *Id.* at 230.

157. *Id.* at 230–31.

158. *Id.* at 231.

159. *Id.*

160. *Id.* at 232.

the trade secret and the productive process.”¹⁶¹ Because the Court lacked a full record, it left the question of whether this definition applied to the information at issue in this case for the district court.¹⁶²

On remand, however, the district court never reached this question. Rather, the parties reached a stipulated settlement agreement, under which the Oil and Gas Conservation Commission agreed to a more stringent process for vetting fracking operators’ trade secret claims.¹⁶³ Specifically, the settlement agreement requires the Commission to adopt a detailed review process that places the onus of gaining trade secret protection on fracking operators by requiring documentation of issues like the steps taken to protect the supposed trade secret and the ease with which the formula of the fluid is identifiable through disclosure of the chemical identity of the fluid’s additives.¹⁶⁴

While Wyoming’s approach to evaluating fracking operators’ trade secret claims is among the most rigorous in the country, the *Powder River Basin* case illustrates the risk of litigation that comes with the tension between public records laws that favor broad transparency and the operators’ interest in protecting their valuable trade secrets from being destroyed through disclosure. When state regulators opt to take custody of the claimed trade secrets for vetting, the balancing of these interests requires courts to “to review the disputed information on a case-by-case, record-by-record, or perhaps even on an operator-by-operator basis.”¹⁶⁵ This process, which is arguably necessary to achieving broad disclosure, strains state resources and forces states like Colorado to abstain from individually evaluating trade secret claims.

B. Trade Secrets and the Medical Community’s Right to Know

Health and safety concerns are at the core of the movement for greater transparency in fracking. The potentially harmful impact of slickwater fluids on drinking water is the “most contentious” issue in the public debate over fracking,¹⁶⁶ and calls for greater disclosure are most pronounced following disasters like the Monroe County incident.¹⁶⁷ As a result, most states that regulate fracking fluid disclosure require operators to provide

161. *Id.* at 234.

162. *Id.* at 234–35.

163. Stipulated Settlement Agreement, *supra* note 117, at 3.

164. *Id.* at Exhibit B.

165. *Powder River Basin Res. Council*, 320 P.3d at 235.

166. Furlow & Hays, *supra* note 4, at 292.

167. *See Blake*, *supra* note 46.

chemical information to emergency responders and medical personnel irrespective of the information's status as a trade secret.¹⁶⁸ However, these provisions generally restrict disclosure of the information beyond the immediate treatment and require medical personnel to sign non-disclosure agreements.¹⁶⁹ Moreover, these laws often "tie in a ban with harsh penalties against any disclosure of the formula by the physician."¹⁷⁰

The restrictive nature of these regulations has drawn the ire of the medical community, and this conflict has boiled over to litigation. In Pennsylvania, Dr. Alfonso Rodriguez, a nephrologist, sought to invalidate the state's "Medical Gag Rules" on fracking fluid disclosures because they were an impermissible content-based restriction on his First Amendment rights.¹⁷¹ Specifically, Dr. Rodriguez sought to invalidate §§ 10 and 11 of Pennsylvania's fracking chemical disclosure statute¹⁷² because they interfered with his ethical obligations by preventing him from readily communicating "which toxins a hemodialysis patient may have been exposed to."¹⁷³ The district court dismissed Dr. Rodriguez's claim, concluding that he lacked standing because his claimed injuries were conjectural and that, even if he had an injury-in-fact, he lacked standing because his complaint focused on water quality and invalidating the "gag rules" would not provide him that information.¹⁷⁴ Although commentators were critical of the district court's dismissal of Dr. Rodriguez's strong First Amendment claim,¹⁷⁵ the Third Circuit ultimately affirmed the dismissal.¹⁷⁶

While Pennsylvania's "gag rule" laws survived Dr. Rodriguez's challenge in federal court, the Pennsylvania Supreme Court declared them unconstitutional in 2016, less than two years after the Third Circuit

168. See, e.g., 16 TEX. ADMIN. CODE § 3.29(c)(4) (2012) (R.R. Comm'n of Tex., Hydraulic Fracturing Chemical Disclosure Requirements); TENN. COMP. R. & REGS. 0400-53-01-.03(1)(f) (2013).

169. See 16 TEX. ADMIN. CODE § 3.29(g) ("A health professional or emergency responder to whom information is disclosed under subsection (c)(4) of this section must hold the information confidential . . .").

170. JAMES T. O'REILLY, *THE LAW OF FRACKING* § 10.6 (2019).

171. *Rodriguez v. Abruzzo*, 29 F. Supp. 3d 480, 481–85 (M.D. Pa. 2014), *aff'd sub nom. Rodriguez v. Sec'y of Pa. Dep't of Env'tl. Prot. of Pa.*, 604 F. App'x 113 (3d Cir. 2015).

172. 58 PA. STAT. AND CONS. STAT. ANN. § 3222.1(b)(10)–(11) (West 2012).

173. *Rodriguez*, 29 F. Supp. 3d at 485.

174. *Id.* at 485–86.

175. See Benjamin W. Cramer, *What the Frack? How Weak Industrial Disclosure Rules Prevent Public Understanding of Chemical Practices and Toxic Politics*, 25 S. CAL. INTERDISC. L.J. 67, 98 (2016).

176. *Rodriguez*, 604 F. App'x at 115.

affirmed the dismissal of Dr. Rodriguez's case.¹⁷⁷ In *Robinson Township*, a group of municipalities, interest groups, and individuals, including physicians, collectively referred to by the Court as "Citizens," launched a broad challenge on Act Thirteen, Pennsylvania's oil and gas statute on the grounds that it was a special law in violation of Article III, Section 32 of the Pennsylvania Constitution.¹⁷⁸

The Citizens challenged multiple provisions of Act Thirteen, including §§ 3222.1(b)(10) and (b)(11), which restricted "medical professionals' access to information about chemicals used in the fracking process" that fracking operators claimed to be trade secrets or confidential, proprietary information.¹⁷⁹ Section 10 governed medical providers' right to access fracking fluid information and the normal course of treatment, and section 11 governed emergency disclosures.¹⁸⁰ The Court ultimately concluded that both provisions foreclosed "health professionals from disclosing to other health care professionals any clinical findings they make during the course of treating a patient."¹⁸¹ Moreover, according to the Court, §§ 10 and 11 improperly restricted physicians' ability to "to facilitate the development of effective future treatment plans for such exposures" through publication in medical journals.¹⁸² Because these "sweeping" restrictions were only afforded to the oil and gas industry, the Court concluded that they were "special laws" and that "no manifest peculiarity" justified their unique application to fracking.¹⁸³ Thus, the Court deemed the provisions unconstitutional and enjoined their further application and enforcement.

Robinson Township was a victory for the citizen groups challenging Pennsylvania's oil and gas statute, but it ultimately left all parties involved with more uncertainty than progress. While the Pennsylvania Supreme Court invalidated the "medical gag rules" on state constitutional grounds, it did not provide the legislature with guidance on properly regulating the disclosure of fracking fluid compositions in the medical context. In this sense, *Robinson Township* is a symptom of the larger conflict surrounding trade secrets and the regulation of fracking fluids and the uncertainty that comes with handling an issue of major public concern through a patchwork of state regulations.

177. *Robinson Twp. v. Commonwealth*, 147 A.3d 536, 576 (2016).

178. *Id.* at 546 (citing PA. CONST. art. III, § 32).

179. *Id.* at 569.

180. 58 PA. STAT. AND CONS. STAT. ANN. § 3222.1(b)(10)–(11) (West 2012).

181. *Robinson Twp.*, 147 A.3d at 575.

182. *Id.*

183. *Id.* at 575–76.

IV. Fracking Patents—The Way Forward?

As the tension between trade secrets and fracking disclosures appears increasingly intractable, there is a growing trend of promoting compromise through an entirely different area of intellectual property law—the law of patents.

While fracking operators have turned to the patent system since Stanolind developed the technology in 1948,¹⁸⁴ the shale revolution originated in a time when the fracking sector was “fundamentally patent free.”¹⁸⁵ Since that time, however, the number of fracking patents issued by the U.S. Patent and Trademark Office (“USPTO”) has increased substantially.¹⁸⁶ Patent applications for fracking fluids are the driving force behind this increase.¹⁸⁷

Several commentators have pointed to fracking patents as the proper means of resolving the conflict between trade secret protections and fracking disclosure regulations.¹⁸⁸ This contention is not without merit. After all, patents are a tool of compromise. To promote “the progress of science and the arts,”¹⁸⁹ Congress established the patent system to grant inventors private, limited monopolies in exchange for “full disclosure of the patented invention and its dedication to the public on the expiration of the patent.”¹⁹⁰ This compromise is frequently referred to as the “quid pro quo of the patent monopoly.”¹⁹¹ The patent quid pro quo is preferable to the current system of protecting fracking fluids through trade secrets because it strikes a compromise that is advantageous to all parties involved. With a limited monopoly, fracking operators can enforce their intellectual property rights and maintain a competitive advantage, and the disclosure mandated by patent law provides citizen groups and regulators with detailed

184. Treatment of Wells, U.S. Patent No. 2,596,844 (filed May 28, 1948) (issued May 13, 1952).

185. Golden & Wiseman, *supra* note 35, at 1000.

186. Cahoy Et Al., *supra* note 14, at 290–91.

187. *Id.*

188. See Sarah Spencer, Note, *Either Secrecy, or Legal Monopoly: Why We Should Choose Fracking Patents*, 42 WM. & MARY ENVTL. L. & POL’Y REV. 599 (2018); John Craven, Note, *Fracking Secrets: The Limitations of Trade Secret Protection in Hydraulic Fracturing*, 16 VAND. J. ENT. & TECH. L. 395 (2014).

189. U.S. CONST. art. I, § 8, cl. 8 (grants Congress power to “promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries”).

190. Scott Paper Co. v. Marcalus Mfg. Co., 326 U.S. 249, 255 (1945).

191. See, e.g., Rebecca S. Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. CHI. L. REV. 1017, 1022 (1989).

information on the chemical additives used in fracking. However, there are significant legal and practical obstacles that make fracking patents untenable as a complete alternative to trade secret protection.

A. The Advantages of Fracking Patents

Overall, the use of patents to protect fracking fluids, as opposed to trade secrets, provides relative advantages to all parties involved.

Compared to trade secrets, patents provide fracking operators with stronger, more readily enforceable intellectual property protections. Because trade secrets depend on secrecy for legal protection, they “stand ready to be lost forever on the whim of a third party, by inadvertent or intentional disclosure.”¹⁹² Conversely, disclosure is a requirement for patent protection.¹⁹³ If a proper disclosure is made and a patent is granted, the patentee has the right to prevent all others from making, using, selling, or offering to sell the invention within the United States.¹⁹⁴ While trade secrets are only protectable against “misappropriation,” fracking operators can enforce their rights against other parties that infringe their claimed invention irrespective of whether the party created the invention independently.¹⁹⁵ As a result of the increase in “fracking patents,” fracking operators have increasingly utilized broad patent protection to pursue claims of infringement against competitors that have infringed on patented fluid technology.¹⁹⁶ Simply put, the protection available to patentees is broader than the protection available through the law of trade secrets, which only protects against misappropriation and not independent invention or reverse-engineering.¹⁹⁷

Patents also provide fracking operators with greater economic incentives than trade secrets. While trade secrets can serve as a tool of innovation,¹⁹⁸ there is no novelty requirement for trade secret protection.¹⁹⁹ Alternatively, novelty is an integral requirement of patent protection.²⁰⁰ Therefore, to gain

192. 2 MELVIN F. JAGER, *TRADE SECRETS LAW* § 7.2 (2020).

193. *See* 35 U.S.C. § 112 (2012).

194. *See* 35 U.S.C. § 271(a) (2010).

195. *See, e.g.*, W. Nicholson Price II, *Regulating Secrecy*, 91 WASH. L. REV. 1769, 1777 (2016).

196. *See generally* EnerPol, LLC v. Schlumberger Tech. Corp., No. 2019-1079, 2020 WL 1527778 (Fed. Cir. Mar. 31, 2020) (litigation over infringement of U.S. Patent No. 6,949,491, which relates to the use of “degradable polymers” as a fracking fluid).

197. UNIF. TRADE SECRETS ACT § 1(4) cmts. 1–2 (UNIF. LAW COMM’N 1985).

198. *See* Kewanee Oil Co. v. Bicron Corp., 416 U.S. 470, 481–85 (1974).

199. *Id.* at 476.

200. 35 U.S.C. § 101 (2015).

patent protection for a fluid technology, a fracking operator will need to develop a “new and unique” fluid composition.²⁰¹ While trade secret law provides operators with an incentive to develop unique fluids through the promise of protection against misappropriation, the possibility of a patent monopoly and the greater protection that comes with it would likely incentivize operators to develop better, more advanced fluids. Moreover, because patents can be easily licensed, operators could add a revenue stream by developing advanced fluids for particular shale formations and licensing the fluid composition to competitors operating in the same formation.²⁰²

Likewise, the patent system offers substantial benefits to those who would prefer broader disclosure of fracking fluid information. Under the current regulatory patchwork, even the most comprehensive fluid disclosures offer an incomplete picture of the chemical make-up of fracking fluids.²⁰³ However, to obtain patent protection, an operator would need to provide a full, clear, and exact written description of the invention with sufficient information to enable a person “skilled in the art” to make and use the invention.²⁰⁴ Accordingly, fracking patent applications provide more useful information than any existing disclosure regulation. Moreover, patent law aligns the interests of fracking operators and regulators in two meaningful ways. First, the patent law includes a limited safe harbor for individuals using an invention that would otherwise infringe a claimed invention if the use is in good faith and more than one year before the patentee filed their application or publicly disclosed their invention.²⁰⁵ By design, this defense incentivizes would-be patentees to file an application as early as possible. In the context of fracking fluids, operators would have an incentive to file a patent application as soon as they had a completed formulation. In addition to expanding the scope of the fracking operator’s patent rights, this early filing would provide regulators and citizens with comprehensive fluid information either immediately before the fracking began or shortly after. Second, because the patent system places the burden of disclosure on the party seeking protection, rather than on a state regulator, the tension of public records litigation and the accompanying strain on state resources would be eased significantly.

201. Craven, *supra* note 188, at 419.

202. *See id.* at 419–20.

203. *See* McFeeley, *supra* note 101, at 899.

204. 35 U.S.C. § 112(a) (2012).

205. 35 U.S.C. § 273(a) (2011).

B. Obstacles to Patent Law as a Viable Alternative to Trade Secrecy

Despite the advantages of fracking patents over trade secrets, there are significant legal and practical obstacles that will likely prevent the patent system from supplanting trade secrets as a viable means of protecting fluid composition for most fracking operators.

1. Legal Obstacles

To successfully obtain a patent, an applicant must meet five requirements: (1) the subject matter must be patentable under § 101 of the patent act; (2) the claimed invention must have utility; the claimed invention must be (3) novel and (4) nonobvious; and (5) the applicant must disclose the claimed invention with sufficient detail in a written specification.²⁰⁶ Of these requirements, utility is unlikely to be an issue in the context of fracking fluids because a patent will only be withheld on utility grounds if it “has no practical utility.”²⁰⁷ Moreover, fracking fluids are likely patentable as a “composition of matter” under § 101.²⁰⁸ Assuming that the operator provides an adequate disclosure with their application, non-obviousness and novelty remain the most likely legal obstacles to patentability for fracking fluids.

The non-obvious requirement asks whether the claimed invention is enough of technological advance to warrant patent protection. More specifically, non-obviousness is a question of whether the claimed invention is an advance over the existing body of publicly available inventions, known as the prior art, as judged by a “person having reasonable skill in the art.”²⁰⁹ This requirement is considered by many to be the “ultimate condition of patentability,” and it is at the heart of the patent quid pro quo.²¹⁰ Evaluating the non-obviousness of a claimed invention requires determining the scope and content of the prior art, assessing the differences between the claimed invention, and resolving the level of ordinary skill in the art.²¹¹ In the context of fracking fluids, the prior art is

206. MENNELL, LEMLEY & MERGES, *supra* note 26, at 161.

207. *Id.*; see also 35 U.S.C. § 101.

208. U.S. Patent No. 6,949,491 (filed Sep. 24, 2002) (issued Sep. 27, 2005) (patent issued for “[c]omposition and degree of polymerization of the degradable polymer and the selection of additives may be varied to adjust the viscosity, degradation time and other properties of the fracturing fluid.”).

209. 35 U.S.C. § 103 (2011).

210. Lee Petherbridge & R. Polk Wagner, *The Federal Circuit and Patentability: An Empirical Assessment of the Law of Obviousness*, 85 TEX. L. REV. 2051, 2054 (2007).

211. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966).

significantly limited by the prevailing trend of protecting fluid formulas as trade secrets. Therefore, because fracking fluid formulas generally vary by well and formation, operators should be able to clear this hurdle if their claimed fluid differs from the body of publicly available formulas in a way that would not be obvious to an operator of reasonable skill in the art of composing fracking fluids.

The novelty requirement is, however, the largest legal obstacle to patent protection for most fracking operators. Like non-obviousness, novelty is “at the heart of the patent system.”²¹² Novelty is a question of whether a claimed invention is new, as determined by the prior art. Historically, novelty has been covered under § 102 of the patent act, along with the related concept of “statutory bars,” which set out actions by the inventor that preclude a patent from issuing. However, under the America Invents Act (“AIA”), § 102 was simplified, and removed the distinction between novelty bars and statutory bars.²¹³ That said, in the wake of the AIA, the Supreme Court held that the revisions to § 102 did not change the meaning of previously interpreted terms like “on sale,” so pre-AIA caselaw is useful in interpreting and applying § 102 bars.²¹⁴

Presently, an invention is barred from patentability due to a novelty bar if “the claimed invention was patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention.”²¹⁵ However, in limited circumstances, a so-called grace period is available if the prior art disclosure occurred one year or less before the applicant filed to patent their claimed invention.²¹⁶ If every element of the claimed invention is disclosed in the prior art under § 102(a)(1), it is said to be “anticipated” and, therefore, non-novel.

For fracking operators, the most important form of prior art is “public use.” In this context, public use is “any use of [the claimed] invention by a person . . . who is under no limitation, restriction or obligation of secrecy to the inventor.”²¹⁷ While the use of fracking fluids on a well is not within most common definitions of public, the Fifth Circuit established that the touchstone of publicity is the lack of “deliberate efforts” to conceal the invention and protect its secrecy in the landmark case of *Rosaire v. Baroid*

212. 1 CHISUM ON PATENTS § 3.01 (2020).

213. MENNELL, LEMLEY & MERGES, *supra* note 26, at 201.

214. *Helsinn Healthcare S.A. v. Teva Pharm. USA, Inc.*, 139 S. Ct. 628, 630 (2019).

215. 35 U.S.C. § 102(a)(1) (2015).

216. *Id.* at § 102(b).

217. *Netscape Commc'ns Corp. v. Konrad*, 295 F.3d 1315, 1320 (Fed. Cir. 2002).

*Sales Division National. Lead Co.*²¹⁸ *Rosaire* involved the use of crude oil drilling technology in rural east Texas.²¹⁹ Ultimately, the court determined that the use was public, even though it was geographically isolated, because it was “performed in the field under ordinary conditions without any deliberate attempt at concealment or effort to exclude the public and without any instructions of secrecy to the employees performing the work.”²²⁰ Therefore, any unrestricted use of the claimed fluid technology would be a prior art disclosure that anticipates the claimed invention unless an exception applies under § 102(b). However, most fracking operators are in a fundamentally different situation than the drillers in *Rosaire* because fracking operators typically insist on strict trade secret protection for their fluid formulas. Therefore, it is unlikely that there will be public use in the prior art by a third-party fracking operator that creates a novelty bar for a given formula.

That said, the bigger problem in this context is the applicant’s own “secret public use.” Specifically, “an inventor’s own prior commercial use, albeit kept secret, may constitute a public use . . . barring him from obtaining a patent.”²²¹ This rule serves to channel inventions into the patent system by forcing inventors to choose between the patent system or trade secrecy, thereby “foster[ing] disclosure of patented inventions to the public.”²²² Practically, this means that any fracking operator that has used a fracking fluid commercially for extraction, even under strict trade secrecy, will be barred from patenting the fluid unless they file within a year of the first commercial use.²²³ While there is a limited exception for experimental uses,²²⁴ the bar triggered by an inventor’s prior commercial use will preclude many fracking operators from obtaining a patent on their existing fluid formulas if the fluids are commercially operable and beyond the experimental stage.²²⁵

218. *Rosaire v. Baroid Sales Div., Nat. Lead Co.*, 218 F.2d 72, 74 (5th Cir. 1955).

219. *Id.*

220. *Id.*

221. *Woodland Tr. v. Flowertree Nursery, Inc.*, 148 F.3d 1368, 1370 (Fed. Cir. 1998).

222. *Meds. Co. v. Hospira, Inc.*, 827 F.3d 1363, 1372 (Fed. Cir. 2016).

223. *See* 35 U.S.C. § 102(b)(1)(A) (2015).

224. *See Meds. Co.*, 827 F.3d at 1377 (citing *Elizabeth v. Pavement Co.*, 97 U.S. 126, 137 (1877)).

225. *See* CHISUM, *supra* note 212, at § 3.05. It is important to note that the USPTO has taken the position that the AIA’s inclusion of the phrase “or otherwise available to the public” in section 102(a) did away with “secret public use.” *See* U.S. PATENT & TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE § 2152.02(c) (9th ed., rev. June 2020) (“[P]ublic use under AIA 35 U.S.C. 102(a)(1) is limited to those uses that are available to

Because of § 102's bar on prior commercial use, current fracking operators will not be able to gain patent protection for fluid technologies currently in use unless they file within one year of the first use of the fluid. This bar effectively limits the utility of patents as a means of protecting fracking fluids to new fracking fluids.

2. *Practical Obstacles*

Even if fracking fluids are patentable, there are practical obstacles that make it unlikely that many operators will abandon their trade secret claims in favor of patent protection.

The first obstacle is the process of obtaining a patent through the USPTO, which is known as patent prosecution. The prosecution process typically involves several rounds of amendments and negotiations with the USPTO, and the process takes, on average, over two years to complete.²²⁶ Although roughly three-quarters of all patent applications are ultimately granted, the prosecution process is inarguably time-consuming and costly.²²⁷ The prolonged nature of prosecution makes the patent system a poor fit for fracking operators, many of whom alter their formulas from well to well and do not perfect their formula in advance of the drilling operation.²²⁸ Due to the inconsistent nature of fracking fluid formulas, many operators will likely prefer to continue protecting their intellectual property through trade secrecy, which requires no application and is created contemporaneously with the secret.

Moreover, practical problems with enforcement will likely dissuade many fracking operators from making the transition from trade secrecy to patents. Because most fracking fluids are protected vigilantly as trade secrets, and the fluids themselves are injected into the ground, it will be exceedingly difficult for patentees to detect infringement in the market.

the public.”). But the Supreme Court has strongly suggested otherwise, holding that “otherwise available to the public” is “catchall phrase” that does not change the meaning of terms that have acquired an established meaning in pre-AIA caselaw. *Helsinn Healthcare S.A. v. Teva Pharm. USA, Inc.*, 139 S. Ct. 628, 634 (2019). *Helsinn* involved a challenge to “secret sales,” so it did not directly resolve this question, but it provides ample reason to suspect that the same reasoning applies to “secret public use.” *Id.* (“[T]he addition of ‘or otherwise available to the public’ is simply not enough of a change for us to conclude that Congress intended to alter the meaning of [a reenacted term]”).

226. John R. Allison & Mark A. Lemley, *Who's Patenting What - An Empirical Exploration of Patent Prosecution*, 53 VAND. L. REV. 2099, 2101–03 (2000).

227. See, e.g., Mark A. Lemley & Bhaven Sampat, *Is the Patent Office a Rubber Stamp?*, 58 EMORY L.J. 181, 184–85 (2008).

228. Hall, *supra* note 6, at 425.

Commentators have dismissed this concern by arguing that the inability to enforce patent rights will result in only “somewhat less of a competitive advantage” because the patent system will still incentivize the creation of more efficient fluid technology.²²⁹ However, the entire premise of the patent quid pro quo is that the patentee gains a monopoly over their invention in exchange for disclosing the information to the public. If enforcement is impossible, the monopoly ceases to exist, and fracking operators will have no incentive to develop more efficient technologies to license to competitors. Moreover, any incentives gained from patenting a fracking fluid formula must be measured against the costs of patent prosecution. Without the possibility of enforcing their patent and recouping the fixed costs of development and prosecution, fracking operators have little reason to choose patents over trade secret protections.

In short, patents are superior to trade secrets as a means of protecting fracking fluid technology because they allow operators to maintain their rights while facilitating thorough disclosure for regulators and private citizens. Nevertheless, it is unlikely that patents will serve as a viable alternative to trade secrets industrywide because many operators will be unable or unwilling to abandon their trade secret protections in favor of fracking patents.

V. Conclusion

The tension between fracking disclosure regulations and trade secret protection for fluid compositions is unresolved. While state fracking regulations have expanded over the past two decades, the public’s knowledge of fluid compositions remains incomplete, largely because of the inherent conflict between proprietary information and the public’s right to know. The growing trend of fracking patents eases this tension and strikes a more favorable balance between protection and disclosure. However, because of the immense legal and practical obstacles to patentability facing most fracking operators, patents are ultimately an incomplete resolution to this problem.

229. Craven, *supra* note 188, at 421.